Sciaticofemoral nerve block for varicose vein surgery in the patient with eventration of diaphragm, dextroposition of the heart and bicuspid aortic valve

Sir,

Eventration of diaphragm is abnormal elevation of part or whole of the hemidiaphragm. It may be congenital or acquired. It is a condition rarely encountered in adults and most often asymptomatic, hence detected incidentally. Left diaphragmatic eventration can displace the heart to the right mimicking dextrocardia. We present the anesthetic management of a patient with left diaphragmatic eventration, dextroposition of the heart and biscuspid aortic valve (AV) for varicose vein surgery.

A 53-year-old man was scheduled for left lower limb varicose vein surgery. Patient had no history of respiratory distress or gastroesophageal reflex. Systemic examination revealed decreased breath sounds in left infra-mammary, infra-axillary, and infrascapular areas with muffled heart sounds. The hematological investigations were within normal limits. ECG showed prominent R waves in right precordial leads. A chest X-ray PA view showed eventration of left diaphragm with cardiac shadow shifted to the right [Figure 1]. Echocardiography revealed a bicuspid AV with good left ventricular function (ejection fraction 55%) and a normal gradient across AV. A diagnosis of dextroposition secondary to eventration of diaphragm with bicuspid AV was made.

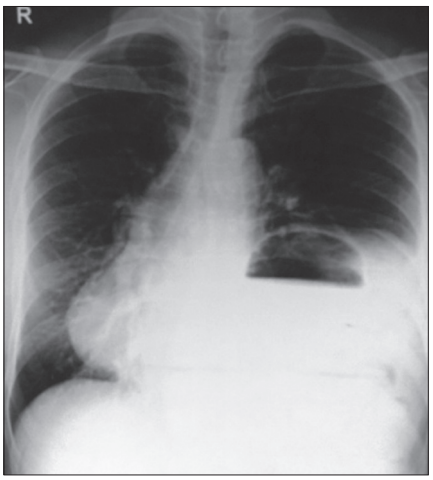

Figure 1: Eventration of the left hemidiaphragm with mediastinal shift and dextroposition of the heart

The surgical procedure was scheduled under sicatiofemoral nerve block. The patient was administered pantoprazole and ondansetron as premedication intravenous (IV) 30 min prior to the surgery. After securing a good IV access and instituting monitoring, the sciatic nerve was blocked by posterior approach with 20 mL of 0.5% ropivacaine and femoral nerve (3-in-block) blocked with 15 mL of 2% lignocaine and 15 mL of 0.25% bupivacaine. Both the nerve blocks were done with nerve stimulator assistance. The patient tolerated the procedure which lasted for 90 min. The postoperative stay of the patient was uneventful and he was discharged 3 days later.

Eventration of diaphragm consists of thinned diaphragmatic muscle producing elevation of entire or part of the hemidiaphragm. The first case of diaphragmatic eventration was reported by Petit in 1774. It is more commonly left sided with mediastinal displacement to the right.[1] Congenital diaphragmatic eventration may go unrecognized even in adults. The exact incidence is not known owing to its rarity and as majority of cases are asymptomatic;[2] however, some have reported the incidence in adults as 1 in 10,000.[1] Acquired diaphragmatic eventration may occur due to phrenic nerve injury, neurological disorders, myopathies, or lesions of the adjacent organs. Diaphragmatic eventration can be associated with bronchopulmonary, cardiac, and gastrointestinal malformations.[3] The symptoms of diaphragmatic eventration are usually mild, but sometimes the patients may have orthopnea, dyspnea, hypoxia, and reduction in lung volumes. Repeated chest infections, gastrointestinal disorders, and palpitation may exist due to the mass effect of the diaphragmatic eventration.[4]

In dextroposition, an otherwise normal heart is shifted to the right by some extracardiac factor such as eventration of the left diaphragm or fibrosis of the right lung.[5] The bicuspid AV is the most common congenital cardiac malformation, occurring in 1–2% of the population.[6] The majority of patients, with bicuspid AV, have relatively normal valve function and remains undiagnosed until late in adulthood, when stenosis develops because of superimposed leaflet calcification.[7]

Our patient remained asymptomatic to diaphragmatic eventration, dextroposition and bicuspid AV. All his coexisting conditions were surprisingly detected incidentally. Decreased breath sounds in the left lung fields prompted us to get a chest radiograph, which showed gross elevation of left dome of diaphragm with the cardiac shadow shifted to the right mimicking a dextrocardia. ECG showed prominent R waves in right precordial leads with normal QRS axis in frontal plane, which was consistent with dextroposition rather than a true dextrocardia.[8]

Anesthetic management of diaphragmatic eventration in adults is not adequately described in the literature as it is rare and asymptomatic. The principles of anesthetic management in diaphragmatic eventration are similar to those of the patients with diaphragmatic hernia. Large gauge IV access should be gained. Arterial and central venous pressure monitoring should be considered if warranted. Any event that leads to sudden increase in intra-abdominal pressure, such as coughing, straining, light plane of anesthesia, intubation, or extubation, may result in diaphragmatic rupture.[4] If the eventrated diaphragm ruptures, the abdominal viscera relocates into the intrathoracic cavity producing mass effect, which leads to direct compression of the heart and resulting in mediastinal shift. Kinking of the vena cavae and pulmonary veins caused by the mass effect may impair venous return to the heart and decreases cardiac output.[9] To prevent the rupture of diaphragm, a deep level of anesthesia should be maintained intraoperatively. Precautions should be taken to avoid straining and coughing at induction, intubation, and extubation. Bag-mask ventilation and nitrous oxide use should be avoided in these patients, as the expansion of intraabdominal viscera can impair the circulation and respiration.[10]

Faheem and Fayad reported a case of spontaneous diaphragmatic rupture after lower limb surgery with epidural anesthesia.[4] The mechanism of the rupture was attributed to increased workload of the diaphragm due to high regional anesthesia. We chose regional technique in the form of sciaticofemoral block, as the proposed surgery was amenable to the same. We did not institute any invasive monitoring as the surgery was not a major procedure, and the patient did not have hemodynamically significant aortic stenosis.

Diaphragmatic eventration with dextroposition of heart and a bicuspid AV are a rare combination. Though general anesthetics have been administered in the past, regional anesthesia seems to be advantageous as it avoids all the potential complications of general anesthetics in these patients. We preferred a sciaticofemoral nerve block, which virtually eliminates the complications associated with central neuraxial blockade and general anesthesia.

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